Revised 07/02

CORRES. CONTROL
INCOMING LTR NO.

00504 RF02

DUE DATE
ACTION

DIST.	LTR	ENC
BOGNAR, E.	X	X
DECK, C. A.	X	X
DEGENHART, K.		
DIETER, T. J.		
DIETERLE, S. E.	X	X
FERRERA, D.W.	X	X
FERRI, M.S.		
GERMAIN, A. L.		
GIACOMINI, J.		
ISOM, J. H.		
LONG, J. W.		
MARTINEZ, L.A.	X	X
MCLAUGHLIN, J.	X	X
NORTH, K.		
PARKER, A.M.		
POWERS, K.		
RHOADES, D. W.		
RODGERS, A. D.		
SCOTT, G.K.		
SHELTON, D.C.	X	X
SPEARS, M.S.		
TRICE, K.D.		
TUOR, N.R.		
VOORHEIS, G.M.		
WILLIAMS, J. L.		
BUTLER, L.	X	X
Foss, D.	X	X

COR. CONTROL	X	X
ADMN. RECORD	X	X
PATS/130		

Reviewed for Addressee
Corres. Control RFP

7/24/02 Date By

Ref. Ltr. #

DOE ORDER #
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CORRESPONDENCE
CONTROL

Colorado Department
of Public Health
and Environment

July 12, 2002

Mr. Joe Legare
Assistant Administrator for Environment and Infrastructure
U.S. Department of Energy-RFFO
10808 Highway 93, Unit A
Golden CO 80401-8200

RE: Interim Measure/Interim Remedial Action (IM/IRA) Decision Document and Draft Responsiveness Summary for the Present Landfill Closure

Dear Mr. Legare:

The Colorado Department of Public Health and Environment and the Environmental Protection Agency have reviewed the above mentioned documents and offer the following attached comments. We have included several additional concerns for the Draft Responsiveness Summary (on comments which we transmitted to you) for the OU7 Conceptual Design report which was dated April 15, 2002. Please revise the Responsiveness Summary as well as the conceptual design report to reflect these comments and concerns. Please see the attachments for additional details and specific comments on these document.

Also, as mentioned in previous correspondence, we are aware that you would like to use available data and lessons learned from the Rocky Mountain Arsenal and other applicable sites in lieu of employing test plots to demonstrate viability at the present landfill. You began to develop this approach in the White Paper entitled Update on Testing and Monitoring Requirements for Alternative Covers in the Western United States dated August 28,2001, however, the comments that we transmitted to you on this document have not been addressed to date. The demonstration that test plots are not necessary prior to constructing the alternative cover remains to be validated and documented. A more rigorous design and monitoring program (as if the entire cap is a test plot) must also be utilized and included in the IM/IRA and subsequent design documents if this approach is to be realized.

ADMIN RECORD

OU07-A-000523

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We consider all design documents to be "Corrective/Remedial Design Plans"and subject to approval as specified in Paragraph 118 of the Rocky Flats Cleanup Agreement. Therefore, we are reserving comment on any design specification pending receipt of the updated conceptual design report.

If you have any questions concerning these comments, please contact Carl Spreng (CDPHE) at 303-692-3358 or Jean MacKenzie (EPA) at 303-312-6258.

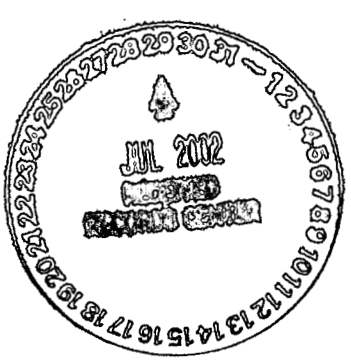
Sincerely,

Steven H. Gunderson
RFCA Project Coordinator
Colorado Department of Public
Health and Environment

Tim Rehder
Rocky Flats Project Manager
Environmental Protection Agency

Attachments (4)

cc: Scott Surovchak, DOE
Dave Shelton, K-H
Lane Butler, K-H
Dyan Foss, K-H
Dan Miller, AGO
Susan Chaki, CDPHE
Steve Tarlton, CDPHE-RFOU
Administrative Record, T130G



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CDPHE RESPONSE TO
DRAFT RESPONSIVENESS SUMMARY FOR THE
CONCEPTUAL DESIGN FOR THE PRESENT LANDFILL CLOSURE COVER
APRIL 15, 2001

General Comment - Many responses provided no information. The evaluation of the issue and any substantive response were deferred to the 60% design. Other issues were deferred to "follow-on design work" without stating when or what would be considered. We would like to know what is being considered for the 60% design before that design is formally submitted.

Comment 1 – Additional details related to the proposed borrow source and a procedure for developing an "Acceptable Zone" have still not been adequately discussed in this report or anywhere else. Rather, the response states that the 60% design will contain the information we requested. We have been discussing this issue for about a year, and we still are not comfortable with the direction the project is heading, primarily because we do not know what they plan to do. What we do know is that up-front sampling and testing takes time, and the project is on an accelerated schedule. We have previously suggested that this item be performed as soon as possible, even if the other design elements are not ready.

Comment 2 – The response to this comment states that the use of a construction test pad will be evaluated. The use of a test pad prior to ET construction must be part of the project, and included in the overall schedule.

Comment 3 – CDPHE will not accept an ET design cover with a soil-rooting medium of less than 4-feet. The response concerning grade fill is irrelevant to the required minimum soil-rooting medium of 4-feet. Also, the soil loss due to erosion over time should be accounted for in the project design. We are not aware that this was provided in the Conceptual Design.

Comment 5 – Lysimeters must be used for performance monitoring in order to measure percolation. This should be clearly stated in the response as well as any future design effort.

Comment 6 – In addition to overseeing "the subcontractor's construction quality control program", the independent CQAE should also review the CQAP, construction drawings, and technical specifications.

Comment 11 – Soil erosion must be measured using erosion monuments. Visual inspections are not adequate.

Comment 27 – Lysimeters must be installed to measure percolation through the cover. See Comment 4 above.

Comment 33 - Response states that the geotechnical data will be forwarded. No timeframe was given nor has the information been received.

Comment 42 - The independent CQAE has a larger role than just overseeing the subcontractor's construction quality control program. See our response regarding Comment 6 above.

Comments by
Colorado Department of Public Health & Environment
On

Draft IM/IRA Decision Document for the Present Landfill
June 20, 2002

General Comments

1. Based on the data provided in Appendix A, there appears to be mercury, silver and zinc concentrations, which may pose a threat to the environment and exceed water quality standards. An evaluation of the data should be conducted to determine if there is any remedial action that needs to be taken to address the elevated levels in surface water, seep water and possibly pond sediments.

2. The potential presence of contaminants other than VOCs in the seep, surface water, and sediments (e.g., Hg, Ag, Zn, Cd) requires more current data in support of decision-making related to future management measures for the pond or for pond closure. Please provide a more comprehensive data summary of historical results and the most recent results to determine the need for additional characterization to support decision-making processes.

3. The regulatory status of the landfill pond needs to be determined prior to final decision on closure of the pond. The pond is within the OU7 boundary and receives F039 listed waste from the landfill seep. Please incorporate an evaluation of the regulatory status of the pond/pondwater.

4. Will OU7 be closed in a final site-wide CAD/ROD or in a separate OU-specific CAD/ROD?

Specific Comments

1. Section 1.0 – The stated purpose of the cover is "to isolate landfill wastes by minimizing or preventing precipitation from infiltrating the landfill, contacting waste, and generating leachate" (Section 3.1). The cover implemented by this IM/IRA will address about half the volume of water that flushes through the landfill. The remainder leaks into the landfill from breaches or underflow of the north side groundwater barriers. It is, therefore, difficult to separate the remedial action proposed in this IM/IRA from groundwater issues as the 6th paragraph in the introduction states.

2. Sections 2.1 and 2.4 - Water below the landfill is referred to as leachate at the end of Section 2.1, and as groundwater in Section 2.4. This discrepancy needs to be addressed.

3. Section 2.2 – This section states that the presumption is that the former leachate collection system still drains to the now covered West Landfill Pond. Is there a plan to investigate the status of this system, e.g., was the system ever plugged?

4. Section 2.5.3 - The water volumes in this section are discussed in terms of both gallons and cubic feet. This section and other discussions should be examined for consistency in units. None of the ground water information presented in this document, including the ground water modeling studies mentioned on page 17, is referenced to a source.

5. This section reports differing seep flow rates. It is hard to reconcile the approximately 750,000 cubic feet per year (apparently based on the highest recorded rate per minute, 11 gpm) with the annual flow during the wettest year, 223,000 cubic feet per year (based on the average flow rate of 3.2 gpm). This discrepancy apparently resulted from extrapolating the 11 gpm flow rate to an annual rate, which is unrealistic. These figures compare with the "56,000 cubic feet per year to more than 1,000,000 cubic feet per year" estimated groundwater recharge, which is said to account for about half the flow at the seep. It is impossible to understand whether all of the recharge to the landfill exits at the seep from this discussion. The fracture zone known to extend through the landfill was shown to conduct water where it was investigated north of the landfill. Flow in this fracture zone should be investigated north and south of the landfill to determine what impact it has on flows into or out of the landfill.

6. Section 2.9.4 - Given the presence of mercury in the surface water, sediments need to be sampled to determine the potential presence of mercury, which could have an impact on waterfowl.

7. Section 2.9.6 – The 5th paragraph discusses ground water quality down gradient of the landfill and suggests an "unknown secondary contaminant source". Please indicate how and when this contaminant source will be investigated and resolved.

8. Section 3.0 – Further investigation is needed, but a ground water remedy will probably be necessary based on the information presented in this document. If the southern ground water intercept system is found to be functional, it might be allowed to collect the low level PU&D yard plume and direct the water through the passive treatment system.

9. Section 3.1 – What will be the impact to the ET cover by building the passive treatment system on the slope of the cover? Is a composite cover planned in this area?

10. The 1st bullet under the 60 percent design guidelines could include the statement that the asbestos pits will be covered by the landfill cover.

11. The 3rd bullet under the 60 percent design guidelines mentions a minimum 3 feet of soil rooting medium. Recent discussions indicated that a minimum 4-feet, and not 3-feet, of soil rooting medium would be used for all ET cover areas.

12. Section 3.2 - The IM/IRA needs to contain a discussion of the potential removal of contaminated sediments at the time of pond closure.

13. Section 3.2.4 – Text should be added to the 3rd paragraph of this section or to Table 1 explaining that the costs shown in Table 1 are based on using borrow material from the nearby LaFarge quarry.

14. Section 3.2.6 – This section does not discuss possible alternatives to the current passive treatment system. Are there other technologies, which could be used to enhance the attenuation/degradation of the contaminants such as induced wetlands, phtyoremediation, or a reactive barrier treatment system?

15. Discharging into No Name Gulch will require an addition to the NPDES permit.

16. Section 3.2.8 – The revegetation plan should be appropriate for use on an ET cover as well as "meet the K-H Ecology Group requirements."

17. Section 3.3.8 - The following added phrases may add clarity to the 1st and 3rd sentences in this section.

> Wastes generated as a result of the proposed action will be limited to office trash and other sanitary wastes moved during re-contouring operations.
> Wastes other than sanitary trash generated as a result of this proposed action...

18. Section 4.0 – The text should state that this IM/IRA serves as a RCRA Closure Plan. The OU7 decision document that the agencies commented on in 1996 was titled, "OU7 IM/IRA and Closure Plan."

19. Section 4.2 – Section 3.5, mentioned in the 1st paragraph of this section, is not in the version of the IM/IRA given to the regulating agencies.

20. Landfill leachate is a RCRA listed waste and should be discussed in this section on RCRA closure.

21. Some of the information mentioned in this section may not be, but should be, included in Section 3.2.

22. Section 4.3 – CHWA (6 CCR 1007-3 §265.115) requires that a Certification of Closure for the RCRA unit be prepared by an independent registered professional engineer. This Certification could be included as part of the Closeout Report.

23. Section 5.1 – The State requires that any institutional controls be registered through an Environmental Covenant with the State.

24. Section 5.2.1 – The post-closure care requirements in Part 365.310 refer to the groundwater monitoring requirements in Part 265, Subpart F. As stated, the groundwater monitoring wells "will be used primarily to determine if contaminants that have the potential to impact surface water are leaching from the landfill." This is not consistent with the statement that "compliance will be based on generally declining contamination levels."

25. Since groundwater flows toward the landfill from 3 directions, at least 3 up gradient monitoring wells are needed. Because of the size and topography of the downgradient area, more than 3 wells will probably be needed to provide coverage for downgradient monitoring.

26. Water quality analytes should include radionuclides, metals and VOCs. A better evaluation needs to be done to understand if water quality parameters already showing problems (sodium, chloride, and sulfate) will be improved by this remedy or if alternate concentration limits will be needed.

27. Groundwater monitoring DQOs need to be refined for each monitoring situation; some wells will require quarterly monitoring, others may not. Groundwater level monitoring will be needed within the landfill to document the effectiveness of the cover and/or ground water remedy.

28. The statement that "groundwater is not discharged to surface water in No Name Gulch" is inaccurate. This is supported by discussion in Section 2.4.2 and 2.5 that groundwater contributes to the landfill pond which is in the headwaters of No Name Gulch. Further, Section 2.4.2 discusses "groundwater seepage past the dam, into the lower drainage, flows eastward along the stream course until it is discharged via ET, surface water, or as lateral subsurface flow at Indiana." Other documents identify that subsurface flow at Indiana in minimal. Even though the end of Section 2.5.2 indicates that "no groundwater seeps have been observed to flow into No Name Gulch below the East Landfill Pond", does not mean that there is no groundwater discharge to No Name Gulch, especially if the landfill pond is removed, then there would be direct groundwater discharge to No Name Gulch.

29. Section 5.2.3 – This section requires modification to indicate that if the landfill pond is removed or if pond water is managed as batch-and-release to No Name Gulch, compliance monitoring is required, not performance evaluation of the passive treatment system.

30. The text should mention whether the surface water monitoring/gauging stations located down gradient of the landfill pond and used to monitor the diverted surface water, will remain as they currently exist.

31. Potential landfill pond scenarios and respective surface water monitoring programs.

- *Landfill Pond is Removed* - For the scenario of the removal of the landfill pond, future surface water monitoring locations will need to be considered as points of compliance (POCs) and not performance monitoring or points of evaluation (POEs). POCs would have to be established, as there would be no other water management measures once the leachate/groundwater seep discharges to No Name Gulch. At that point the water is "out of the control" of the facility.

- *Landfill Pond Remains, Accumulated Water Managed as Batch-and-Release to No Name Gulch* - If the landfill pond remains and the water is no longer managed through the A-series ponds, then water management measures to attain dam safety limits would involve implementation of batch and release activity (assuming conducted to the No Name Gulch Drainage). This would result in the need to establish a surface water monitoring location at the outfall of the landfill pond, which would have to be designated as a POC.

- *Landfill Pond Remains, Water Managed through A-series Ponds (current practice)* - Surface water sample location would be designated as a POE or performance monitoring point.

32. Since the final pond configuration is unknown, these different scenarios should be presented in the IM/IRA. These scenarios and their impacts on surface water monitoring could be summarized in a table.

33. Section 5.2.3, Table 2 - Given that SVOCs and metals have historically been present in the landfill, some frequency of sampling of the COCs plus the historical PCOCs needs to be conducted, especially in the scenario where surface water monitoring is for compliance monitoring. Also, given that the landfill cover and the passive treatment system are being subjected to an interim remedy modification, re-establishing baseline values before cover placement and post-cover placement is necessary to ensure that water quality standards are attained for the protection of surface water. The frequency of monitoring for the COC suite needs to be identified.

34. An evaluation of the Appendix A data for the landfill pond and the leachate at the seep shows that the following metals need to be added to the leachate monitoring program – mercury, silver, cadmium, and zinc. Additionally, if the tritium concentrations exceed the 85th percentile of the water quality standard, then tritium should also be included in future sampling.

35. Section 5.2.3 - If contaminants from the PU&D Yard area could potentially enter into the surface water diversion ditch of the interceptor system, they need to be incorporated into the surface water-monitoring program.

36. Section 6.5 - Can the haul road be aligned with existing roads to minimize new disruption of the grasslands? Will the haul road be reclaimed as part of this project?

37. Section 7.0 - The document specifies an operational period of up to thirty years. The life of the contaminants in the landfill will determine the operational period, impacting LTS requirements.

38. Long-term costs of the project need to be provided, starting with completion of this remedy (not the CAD/ROD, as indicated in Section 7.3) and running through the life of the remedy.

39. Section 7.2 - Restrictions to the landfill cover and groundwater need to be defined. At various places the document refers to possible restrictions, but these should be specified now:

1. Drilling into or use of groundwater is prohibited to the extent of the groundwater plume (to be defined in the project closeout report).

2. The following activities are prohibited on the surface of the landfill (to be defined in the project closeout report): vehicle traffic, any soil disturbance by mechanical means, picnicking, livestock grazing, etc.

40. The State requires that any institutional controls be registered through an Environmental Covenant with the State. The document should identify what enforcement mechanisms DOE expects to use to maintain access restrictions.

41. Section 7.3 - Monitoring and maintenance starts when the project is completed, not when the CAD/ROD is signed.

42. Section 7.4 - Reporting and information management should account for access to the information that is easy and widely available, such as a web site, etc.

43. Section 8.1 – Remove the text in the 4th paragraph, which states that the cover will eliminate groundwater inflow into the landfill. The cover will reduce or eliminate the infiltration of precipitation, not the inflow of groundwater which Section 2.5.3 says contributes half the groundwater within the landfill.

44. Section 8.3 – What are the specific "Site requirements for control and disposition of incidental waters" mentioned in this section?

45. If the dam is breached and the pond is closed, the leachate from the landfill will be a point source discharge and will need to be included in the NPDES permit. This addition to the NPDES permit should be discussed in this document.

46. Section 8.6 - The substantive requirements of the Migratory Bird Treaty Act and the Fish and Wildlife Conservation Act should be identified in this decision document. There is no other appropriate subsequent document for them to appear in.

47. Section 10 – The following items should be added to the list of topics in the Closeout Report:

- Demarcation of wastes left in place (survey benchmarks and measurements) (see Part 265.309)
- Performance monitoring plan
- Determination of areas requiring access

48. In addition to the Closeout Report discussed in this section, a Certification of Closure for the RCRA unit must also be prepared by an independent registered professional engineer and submitted to and approved by CDPHE (see 6 CCR 1007-3 §265.115). This Certification could be included as part of the Closeout Report.

49. Appendix A, Tables A-1 through A-2:
    1. Several analytes in these tables report means that are either greater than or less than the minimum maximum detections.
    2. It would be useful to provide the applicable water quality standards/action levels in the tables for comparison purposes.
    3. Explanatory text or footnotes would be useful; e.g., the code numbers in the PCOC column; the validation codes for the maximum detection column.
    4. For the metals, please indicate if the metals are analyzed as dissolved, total or total recoverable.
    5. The seep leachate should be sampled as part of the uranium ICPMS study.
    6. Where exceedances of the water quality standards occur, please provide an assessment of the 85^{th} percentile.
    7. Why does the Background UTL 99/99 Concentration vary for the same constituent within these tables?

EPA COMMENTS:
REVIEW OF DRAFT RESPONSIVENESS SUMMARY FOR THE
CONCEPTUAL DESIGN FOR THE PRESENT LANDFILL CLOSURE COVER
ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE, GOLDEN, COLORADO

SPECIFIC COMMENT

1. Response Numbers 3, 7, 11, 16, 21, and 22. These responses indicate that a biota barrier will be included in the design. However, they also imply that an agreement was reached at the meeting on May 29, 2002, to accept the concept of a combination gas venting/biota layer design in the 60 percent cover section design. There was no such agreement. This issue remains unresolved.

   It was agreed that additional information from U.S. Environmental Protection Agency (EPA) guidance documents illustrating an acceptable cover section design with a gas venting layer would be sent to Kaiser-Hill (K-H). The information from the EPA guidance document subsequently provided to K-H illustrates the following layers from top to bottom in a cover section: a cobble/soil top layer, equivalent to an erosion protection/soil rooting layer; a geosynthetic filter layer; a biota barrier layer; a geosynthetic filter; a drainage layer; a 20 mil flexible geomembrane liner (FML); a low conductivity layer equivalent to a compacted clay layer (CCL); a geosynthetic filter layer; and a gas venting layer (GVL) above waste.

   It should be noted that the biota barrier and drainage layers are above the FML and the CCL, whereas the GVL is below the FML and CCL. Because the biota barrier layer and the drainage layer are both above the CCL and /or FML, it is acceptable to combine a drainage and biota barrier function in a single appropriately designed layer which is located above the CCL and/or FML. However, it is not acceptable to combine the biota barrier function and the gas venting layer function in a single layer as proposed because the gas venting system (which consists of the GVL, the vents, and the FML and/or CCL) requires the CCL and/or FML above the GVL to provide a positive barrier to the vertical movement of gases into the rooting zone. This difference between the acceptable design in the EPA guidance document and the proposed cover section design was discussed at the meeting on May, 29, 2002, when it was decided that specific additional information from EPA guidance documents would be sent to K-H.

   Therefore, the sections of responses 3, 7, 11, 16, 21, and 22, which imply that an agreement was reached that it was acceptable to use a combination gas venting/biota layer are inaccurate. The responses should be corrected to indicate that at the meeting on May 29, 2002, it was stated that the proposed combination gas venting/biota layer design was contrary to EPA guidance, and that the issue is unresolved. An acceptable cover section design identifying the location and thickness of all layers should be developed by the new design contractor for the project.

EPA COMMENTS: REVIEW OF
THE DRAFT INTERIM MEASURE/INTERIM RESPONSE ACTION (IM/IRA)
DECISION DOCUMENT, DATED JUNE 20, 2002, FOR THE PRESENT LANDFILL
ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE, GOLDEN, COLORADO

GENERAL COMMENT

1. Throughout the document, references are made to the Conceptual Design for the Present Landfill (see examples in the Executive Summary, page 1, and the Footnotes 2 and 3, page 26). Because several key issues are unresolved in this original conceptual design document and because current conclusions and specific recommendations are likely to change, this IM/IRA document should identify the specific version of the conceptual design document that contains the referenced information (such as original, version one, 30% design).

SPECIFIC COMMENTS

1. Executive Summary, Page 1. The fourth paragraph of this section indicates that performance specifications presented in this IM/IRA document will dictate the final design of the evapotranspirative (ET) cover. However, performance specifications are not clearly presented in this document. This section should identify and reference specific performance specifications, and state that ET cover performance requirements will be equivalent to RCRA Subtitle C cover performance requirements.

2. Section 1.0, Introduction, Page 2. The last paragraph discusses the scope of the IM/IRA and indicates that it is unknown if the "landfill is impacting the groundwater." Because there is a known connection between the landfill and the groundwater, decoupling the landfill from the groundwater will produce an incomplete remedial action for the landfill if only the landfill cover is addressed. Therefore, this section should indicate that the document will consider and discuss potential impact of the "landfill on groundwater." In addition, the section should also indicate that the potential impact of "groundwater on the landfill" will also be considered and discussed in the document. Furthermore, it should also be stated that these analyses indicating the groundwater impacts by the landfill or to the landfill and any appropriate measures will be submitted as part of the final design, if warranted.

3. Section 2.9.6, Page 21. This section discusses the groundwater down-gradient of the present landfill. The last sentence on this page indicates that data from 1991 to 1995 were used in this report. The full data suite up to and including data taken in 2002 should be used to assess groundwater conditions. All data should be provided for independent evaluation by the U.S. Environmental Protection Agency (EPA).

4. Section 3.0, Pages 24. This section discusses the project approach. The third paragraph and the bulleted items following the paragraph lists items in the presumptive containment remedy. Because landfill gas and leachate are generated by the landfill these items must be addressed in the design of the remedy. Therefore, the "if needed" phrase should be deleted from the bulleted items referring to landfill gas and leachate. Because you are attempting to use alternate closure methods and are not opting to use field test plots for design purposes, you are required to meet the more rigorous design standards. This needs to be clarified and reflected throughout the IM/IRA and subsequent design documents.

5. Section 3.1, Pages 24 through 27. This section discusses cover alternatives. The three bullets on page 26 provide a general description of a RCRA Subtitle C cap. However, the description is confusing. This section should be revised to describe a RCRA Subtitle C cover consistent with EPA guidelines (EPA 1991) which would apply specifically for this landfill. A drawing should be provided of a section of the cover and

each layer should be identified.

Footnote 2 on page 26 refers to the Alternative Cover Assessment Program (ACAP) and implies that this study indicates that a conventional Subtitle C cover would not be applicable to the Present Landfill. However, a primary reference was not provided that presents the results of the ACAP study. This section should provide a primary reference that substantiates the statements made regarding the inapplicability of a conventional RCRA Subtitle C cover at the Present Landfill. Because the cited ACAP results seem to conflict with the test results from the Alternative Landfill Cover Demonstration (ALCD) project, which show that a properly designed and constructed Subtitle C cover performs better that all covers, including an ET cover, tested over the 5-year period, supporting details of the relevant ACAP program cited should be provided for comparison.

In addition, page 27, third bullet from the bottom refers to the design of the gas venting layer. General Comment Number 1 in the Response to Comments presents a discussion of issues applicable to this bullet, and must be reflected in this document as well.

6. Table 1, Page 25. This table summarizes a comparison of design alternatives. The first row, third column states that "recent studies have indicated that conventional Subtitle C covers do not remain effective in semi-arid environments, such as Rocky Flats." This statement is not consistent with data from the most recent documented results from the ALCD project currently in progress at Sandia National Laboratory, New Mexico. Five years of data from the monitoring of flow through several test sections show that the RCRA Subtitle C cover has the best performance record of covers tested in the ALCD (see ALCD FY2000 Annual Data Report). This section should be revised to provide specific data and references for the "recent studies" cited and also provide the specific test results of the studies cited, or the narrative should be revised accordingly.

   The second column of this table provides a description of the design alternatives. The narrative is unclear. The table should contain or reference a drawing in this document of each alternative section identifying each layer in the section.

   The last column shows relative costs of each alternative. The document should provide calculations and all supporting information for each cost estimate as an appendix in the document.

7. Section 3.2.3, Page 29. This section discusses the proposed gas-venting/biota barrier layer. This proposal is inconsistent with EPA guidance. See Specific Comment Number 1 in the responses to Draft Responsiveness Summary for the Conceptual Design for the Present Landfill Closure Cover for further discussion of this issue and address this in the IM/IRA.

8. Section 3.2.8, Page 31. This section discusses revegetation. The first sentence states the final design will include a revegetation plan that will meet K-H Ecology Group requirements. These requirements need to be clearly stated in this document and this section should also indicate that the plan will fulfil EPA and RCRA performance requirements consistent with the design.

9. Section 5.2.1, Page 36. This section discusses groundwater monitoring. The first sentence of the second paragraph states one upgradient and three downgradient wells will be required for post-closure groundwater monitoring. This sentence should be revised to indicate that this is a minimum requirement, that additional wells may be required, and that the final monitoring plan will show the well locations and provide a rationale for the selection of all wells in the monitoring plan.

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10. Section 5.2.1, Page 38. This section discusses groundwater monitoring. The IF query in the decision statement on page 38 indicates that the mean concentrations in any downgradient well must exceed the concentration in the upgradient well by more than two standard deviations of the data set before a report is made to the appropriate agencies. The agencies should be notified whenever the mean concentration in the downgradient well exceeds the mean concentration in the upgradient well. The phrase "by more than two standard deviations of the data set" should be deleted.

The decision statement also indicates no action other than "continue monitoring." The decision statement should indicate scenarios and criteria that will trigger actions other than monitoring, and specify what those actions will be.

11. Section 5.2.6, Page 44. This section discusses monitoring activities. The sixth bullet and footnote 8 use the terms "soil water coveracity" and "field water storage coveracity." The definition of each of these terms is unclear. This section should provide references for these terms or use terms (such as field capacity) commonly used in the literature.

The eighth bullet indicates that "if the measured lysimeter drainage rate exceeds 1 centimeter (cm)/year, verify the lysimeters are functioning properly." This section should discuss the reasons for using 1 cm/year instead of another criterion, such as," 0.1 cm/month for any month." This section should also discuss the procedure to be used to calculate the annual or monthly flux or drainage criterion, and describe the procedure to be used to verify that the lysimeter is functioning properly.

12. Section 5.3, Page 45. This section discusses performance assessment and reporting. This section should indicate that a monthly data report will be submitted to the regulatory agencies. The annual report should include an evaluation of monthly data and other monitoring data collected during the year.

13. Section 5.4, Page 45. This section discusses corrective measures. This section should be expanded to include all components of the entire system including venting system, drainage system, biota barrier, and vegetation.

14. Section 7.2, Page 55. This section discusses institutional controls. The last sentence of the third paragraph indicates that a fence "could" be erected around the landfill, and that signs "could" be erected that indicate vehicles are prohibited from the surface of the landfill. Institutional controls should be very specific and state that a fence "shall" be contructed around the landfill and signs "shall" clearly state that vehicles are prohibited from the landfill surface. This section on institutional controls should be revised to be more specific.

15. Section 10.0, Page 63. This section discusses "a closeout report" implying a single closeout report will be prepared for the project. Because the plan appears to decouple the ground water remedy from the surface remedy, and the surface remedy requires a performance period to demonstrate that it is "operational and functional," remedial action goals for the landfill will not be achieved immediately after construction of the cover. Therefore, this section should identify the components of the remedial action, provide the schedule for the construction completion period report and the "operational and functional" period report for each component of the remedial action, and the outline of the content of each report.

Reference

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U.S. Environmental Protection Agency (EPA). 1991. *Design and Construction of RCRA/CERCLA Final Covers*. EPA/625/4-91/0254. Center for Environmental Research Information, Cincinnati, OH.